Talent nests

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The ecosystem of innovation, understood as the whole set of institutions, tools, stakeholders and conditions transforming knowledge into wealth, is a complex subject. Understanding its functioning is much more difficult than suggested by simple models that are fortunately coming out of fashion. Nevertheless, it is proven that the key strategy to promote innovation in a sustainable manner is creating environments that cultivate and nourish it – talent nests. The cultivation of such talent occurs at all stages of the educational process, beginning at primary school, and becomes apparent with people doing any kind of professional activity. Organisations doing borderline research and fostering a pioneering spirit are indispensable to it.

Introduction

In a famous speech held at Harvard University during World War II, Winston Churchill said that the empires of the future would be empires of knowledge. He probably referred to empires of freedom and welfare among other things. We talk about knowledge spread throughout society, located in places of the globe where proper conditions are given for entrepreneurial spirit to flourish. We refer to a collective spirit, a tangible affinity, maybe like that felt in Barcelona in 1992, fuelled by enthusiasm and passion about realising dreams. Such are special environments, inhabited by citizens who are and feel creative. We refer to nests of talent and innovation in the ecological sense of the term.

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The search for talent is more alive than ever at global level, especially among organisations acting in sectors and economies moving all over the world. Competitiveness and the level of productivity of any kind of corporation, organisation, region and even country are increasingly dependent on it.

Ideal environments to cultivate talent have many different ingredients, especially regarding education, finance, social values, etc. An indispensable ingredient is an educational system in line with the goal to meet at any level, starting with primary and secondary school. Another necessary piece are world-class universities and research institutions, able and willing to take the lead in specific areas. In this competition, the United States currently enjoy a leading position despite the difficult domestic and international situation the country is facing. Different Asian regions, notably Singapore, India and China, are making massive progress. Northern Europe is also doing well, while the leap to the knowledge economy regarding competitiveness still poses a challenge to Eastern and Southern Europe.

In this brief article we will focus on higher education and borderline research as tools to attract and cultivate a certain type of talent. However, it has to be pointed out that really innovative environments are ecosystems inhabited by people with all sorts of professional skills, abilities, vocations and activities. Higher education and research only cultivate a little portion of necessary talent. In this respect, the paramount importance of the educational system as a whole, from primary and secondary school to professional and continuing training, cannot be emphasised enough when trying to meet specific goals. Northern European countries provide endless examples of results based on a full-fledged top quality educational system.

World knowledge league

In the case of higher education and research, a set of interesting data to take into consideration are international university rankings such as the Academic Ranking of World Universities ; that of Times Higher Education is a specific annual supplement. It is also recommendable to take a closer look at studies related to this subject and the implications particularly for the European and Spanish system, such as the report made by the Bruegel team of experts with the participation of professor Andreu Mas-Colell from the Pompeu Fabra University of Barcelona.

The results of all these rankings need further specifications as they illustrate only a part of a complex reality. To be precise, they are notably subjective as they grasp well the prestige of big universities but not so well the quality of particular groups or faculties, refer mainly to the impact in research rather than education properly, use indicators that are adequate for measuring long-term trends but interpret recent change poorly instead, require an inter-

pretation within each cultural, linguistic and business setting, etc. All in all, we can state that rankings are a reflection of the overall reputation of universities rather than a detailed analysis. Nevertheless, there is no doubt that it is an objective reputation, acquired through consistent policies over decades, addressed to luring, forming, fostering, cultivating and transferring talent.

It is a reputation with a positive feedback that causes chain reactions in innovation, creativity and entrepreneurship, decisive for creating jobs in highly productive, value-added industries. Trends of the ARWU and Times rankings are clearly in line with those inferred from other indicators that are geared to economic impact in a more direct way.

A graphic example of this is the World Knowledge Competitive Index (WKCI) by the UK-based Centre for International Competitiveness that tries to measure the degree of regional competitiveness in decisive factors of development of the knowledge economy. The ranking is made taking into account twenty or so indicators, among which quality of human capital takes an important position.

In 2008, the top 30 positions of the World Knowledge Competitiveness Index included seventeen US, eight European and four Japanese regions plus Singapore.

In the second last ranking published in 2005, 27 of the 30 first positions were taken by US regions, with San Jose (California) and Boston (Massachusetts) leading the list in this order. The Stockholm region (Sweden), ranking 8th, and a Finnish region ranking 20th were among the best. Japan, with Tokyo ranking 22nd, and France, with Ile-de-France 29th, completed the list of the best positioned. The two regions of the Iberian Peninsula featured in the ranking –Madrid region and North-eastern region– were around 100th, thus at the bottom.

In the last available ranking, published in summer 2008, the top two positions are still for San Jose and Boston. San Jose, at the very heart of Silicon Valley, hosts famous Stanford University, is close to Berkeley and feeds on the whole university system of the San Francisco area and California in general. Boston stands in its turn for excellence in higher education, hosting eight renowned research universities, among which Harvard University, the Massachusetts Institute of Technology and the University of Boston.

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The Stockholm region climbs two positions, from eighth to sixth, thanks to a series of factors, mainly consistent investment in education at all levels and in research, with a remarkable stake of private funds. Sweden places yet a second region among the best. Iceland, the Netherlands, Singapore and Switzerland enter the top 30, while Ile-de-France stays 29th and Finland is also represented with two regions. Tokyo surges from 22nd to 9th, being one out of four Japanese regions ranking in the top 30.

Hence this year's top 30 positions include seventeen US, eight European and four Japanese regions plus Singapore. The difference with the 2005 ranking is significant. Progress of Northern European regions (Sweden, Finland, Iceland and the Netherlands) is remarkable, partly based on the high penetration of information technologies as well as the benefit of high-quality educational systems cultivating talent by offering training not only related to contents but also to horizontal skills and abilities, starting at primary, secondary and vocational schools.

At the bottom of the ranking are Chinese, Indian and Eastern and Southern European regions. Spanish regions hold poor, three-digit positions. Among the emerging regions, Shanghai goes on making strong progress together with

Guangdong, also in China. These regions are not in a position to compete with the most advanced of the world yet, but if they keep their current pace of progress, they could soon find themselves among the best.

These data are consistent throughout all studies indicating the potential of Asian countries regarding research, development and innovation. As is well known, an increasing number of multinationals are linking to and signing cooperation agreements with the best universities in different Asian countries in order to seize part of the large technological talent pools available and give them opportunities. *The Economist* published recently a study on the extraordinary level of engineering students at some Iranian universities and on how companies and research and innovation centres from all over the world compete for their graduates despite administrative obstacles and difficulties of any kind imposed by current geopolitical circumstances. The study confirms that the best positioned regions have top-level higher education and research institutions besides other tools to cultivate innovation. At the top of the lists always appear organisations located in cultural and socioeconomic settings encouraging innovative initiatives with a strong technological component.

Ideal innovative society

History is full of examples – 14th century China, 16th century Spain, 20th century Soviet Union – of societies that were not particularly innovative despite having enough economic resources, access to state-of-the-art technology and therefore the potential of cultivating talent and exploiting it to their own benefit.

In this respect, it is useful to go through the ingredients the most innovative societies have had in their grasp both in the past and the present. A classical reference is *The wealth & poverty of nations* by professor David S. Landes from Harvard University. In this section follows an adaptation inspired by the findings of the above-mentioned work.

The list could start with an apparently trivial ingredient that must however not be forgotten, as current events teach us –production tools. This encompasses companies and factories, solid, solvent banks, reliable systems to raise capital and credit as well as investors, venture capital, copyright and intellectual property rights, patent management and exploitation systems, etc.

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The list goes on with availability of borderline science and technology, understood as world-class knowledge. Borderline knowledge needs to be not only learned and mastered but also passed on successfully to the young. Not only established science, namely that one settled a century or a decade ago and featured in books, but also that which is at the borderline defining the limit of what humankind is able to do needs to be transmitted.

There are also human resource selection criteria based on competence for the job and on merit, on encouraging to take risks and initiative, on tolerance towards failure, etc. To foster taking risks and initiative, it is necessary to safeguard individual and collective political, social, property and other rights, with an integer, open and fair society allowing to somehow enjoy the rewards of effort without any discrimination based on physical look, gender, belief or political affiliation.

This list is admittedly ideal and no society fulfils all criteria included. However, it is interesting to state that the most advanced regions comply with most of the list, or did so in the past, but that there are countries in the world hardly fulfilling any criterion.

From the above-mentioned ingredients, there is one that is not always appreciated enough when discussing innovative and wealth-creating environments, namely the need for borderline research organisations.

Borderline science

Research in either basic or applied borderline science produces one of the essentials of innovation in a global world – experienced individuals in the knowledge and use of the most advanced tools and concepts. Competitive companies hire some of these individuals for different reasons: perhaps one of them will every now and then develop a significantly new technological solution for a product or service. Nevertheless, another key motivation is to understand progress made by others and act accordingly.

A reduced but significant number of these individuals comes from PhD programmes – biology, material science, differential geometry, linguistics sociology, , etc. It is less important if the PhD thesis has been done by bringing to practice experiments designed to answer basic questions or rather geared to directly applied or pre-commercial issues. The key is whether PhD students have done the experiment and whether it is really new as such, for if they did it and it is really new, then they will have had to learn how to use advanced tools, some of which may be very new.

Borderline science is done at organisations whose main mission is to attract, cultivate and retain a portion of the talent that enables an innovative business environment.

Borderline science is done at organisations that from time to time generate commercially important technological innovations but whose main mission is to attract, cultivate and retain a portion of the necessary talent to create and keep the hotbed, the atmosphere that enables an innovative business environment consistent over time.

Bill Gates is sometimes mentioned as an example of a legendary innovator who did not finish his degree at Harvard University. But one must not be mistaken. That Bill Gates left university is not the most significant part of it. The important thing is that he decided to go to Harvard despite being brought up in Seattle, a city separated from Boston by a whole continent. In a way, Bill Gates returned to his native Seattle, but the matter is that it is the prestige of research universities such as Harvard that creates the hotbed by which millions of fellow innovators set up and run competitive innovative environments.

At Silicon Valley, the most paradigmatic talent cluster in the world, only roughly one in twenty companies created in the last decades started out of technology invented directly at Stanford University – 5% only, despite Stanford being one of the best universities of the world, standing where it stands and explicitly devoted to research. It is equally interesting to look at the income of universities all over the world for patented research licenses. In all, less than 5% of the research budget of American universities originates in that source. In Europe, this rate is, generally speaking, even lower.

Nevertheless, without higher education, top research and the atmosphere at Stanford, Berkeley and fellow universities throughout California, Silicon Valley would not exist as we know it. Silicon Valley is possible thanks to a whole set of ingredients and historical circumstances, but it is kept running by a whole group of people talented in all kinds of fields attending university at Stanford or Berkeley, and once they graduate or do they PhD they take their entrepreneurial spirit as well as the acquired skills and knowledge to the companies hiring them. It is interesting to point out that in the United States most doctors work in the private sector, whereas in Southern Europe most are employed by public organisations.

Summary

Those institutions and countries trusting in the ability and talent of their people definitely pursue excellence at all levels – excellence in different forms and activities, adapted to people with

diverse vocations who carry out professional tasks of all kinds.

The knowledge borderline offers an excellent opportunity to cultivate a significant kind of talent. It is a definitely real borderline that is hard to push, that separates what humankind knows from what has never been explored, that poses enormous challenges to young entrepreneurs, that yields an outstanding economic return to society in the shape of competitive companies with highly skilled jobs, hard to relocate and potentially well paid.

The exploration of this borderline concentrates people with specific talent, capacity of technological foresight and thus anticipation of and adaptation to change. Such people are one of the most cherished ingredients in innovative environments.

In the real game of economics, in spite of economic crisis and any kind of ups and downs, the world's regions that are poles of talent and freedom are the ones with a good position. It is there where high-quality jobs and opportunities concentrate.

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Notes

1. Academic Ranking of World Universities: *http://www.arwu.org*.
2. Times Higher Education: *http://www.timeshighereducation.co.uk*.
3. Think tank Bruegel: *http://www.bruegel.org*.
4. Centre for International Competitiveness: *http://www.cforic.org*.
5. Landes, D. S. *The wealth & poverty of nations*. Nova York; W.W. Norton & Company ed., 1998. ISBN 0-393-31888-5.